EMULEX

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TLF 84-026 PRINTED IN USA 2-84

CS02/H SUBSYSTEM SPECIFICATIONS

Characteristic	Specification
CC02/H CONTROLLER	
Design	High-speed bipolar microprocessor-based controller for implementation of all CS02/H functional operations.
Function	Through switch selection, provides functional emulation of either the DEC DH11 or two DEC DHV11's on 16 asynchronous channels.
Software Transparency/ Compatibility	All common DH11/DM11 and DHV11 operating systems.
No. of Distribution Panels	All LSI-11 Systems: 1 CP22 panel. MICRO/PDP-11: 1 CP24 panel and 1 optional CP24/B panel.
No. of Lines	16.
Line Formats	Character Lengths: 5-8 bits. Stop Bits: 1, 1.5, 2. Parity: Odd, even, none.
Data Rates	50, 75, 100, 110, 134.5, 150, 200, 300, 600, 1200, 1800, 2400, 4800, 9600, 19200, 38400 baud.
Throughput	60,000 characters per second total.
Distribution Panel Interface	CP22: Sixteen 25-pin male subminiature D-type connectors. CP24: Sixteen 9-pin male subminiature D-type connectors. CP24/B: Four 25-pin male subminiature D-type connectors.
Receive FIFO	DH11 Emulation: 256 characters deep per 16 lines. DHV11 Emulation: 256 characters deep per 8 lines.
CPU Interface	Standard QBus A-B connector interface. Parity checked on all memory reads. One unit bus load.
DMA Address Range	22 bits.
DMA Transfers	16-bit word with parity check.
Device Address	Selectable with switches and PROMs to cover all DEC-defined DH11 and DHV11 assignments.
Vector Address	Switch selectable.
Priority Level	BR5.
Indicators	Green "On Line" LED: Controller on line. Red "Fault" LED: Power-up self-test failure. Red "Activity" LED: Host CPU/ Controller interaction in progress.

Characteristic	Specification
Distortion	Transmitter: Less than 2% intersymbol. Receiver: Up to 43% intersymbol distortion and speed variation.
Option Switches	Dip switches for selection of controller options.
Packaging	Single quad-size four-layer pcb.
Power	5V, 6 amps. 12V, 1 amp.
CP22 DISTRIBUTION PANEL	
Configuration	4.6" high panel for 16 RS-423 (RS-232-C compatible) lines.
Dimensions	4.6" high x 8.4" wide x 2" deep (w/FCC).
Weight	2 lbs.
Electrical Interface	RS-423. Compatible with the RS-232-C EIA standard.
Mechanical Interface	Sixteen 25-pin male subminiature D-type connectors.
Transmission Modes	4 lines: full duplex or half duplex. 12 lines: full duplex.
Modem Control	DTR, RING, and CAR on 12 lines. DTR, RING, CAR, CTS, RTS, and DSR on 4 lines.
CP24 DISTRIBUTION PANEL	
Configuration	3.3" high panel for 16 RS-423 (RS-232-C compatible) lines.
Dimensions	3.3" high x 5.3" wide x 1.7" deep.
Weight	8.5 ounces.
Electrical Interface	RS-423. Compatible with the RS-232-C EIA standard.
Mechanical Interface	Sixteen 9-pin male subminiature D-type connectors.
Transmission Mode	Full Duplex.
Modem Control	DTR, RING, and CAR.
CP24/B OPTIONAL DISTRIBUTION PANEL (for MICRO/PDP-11)	
Configuration	3.3" high panel for 4 RS-423 (RS-232-C compatible) lines.
Dimensions	3.3" high x 2.6" wide x 1.7" deep.
Weight	4.5 ounces.
Electrical Interface	RS-423. Compatible with the RS-232-C EIA standard.
Mechanical Interface	Four 25-pin male subminiature D-type connectors.
Transmission Modes	Full Duplex or Half Duplex.
Modem Control	DTR, RING, CAR, CTS, RTS, and DSR.

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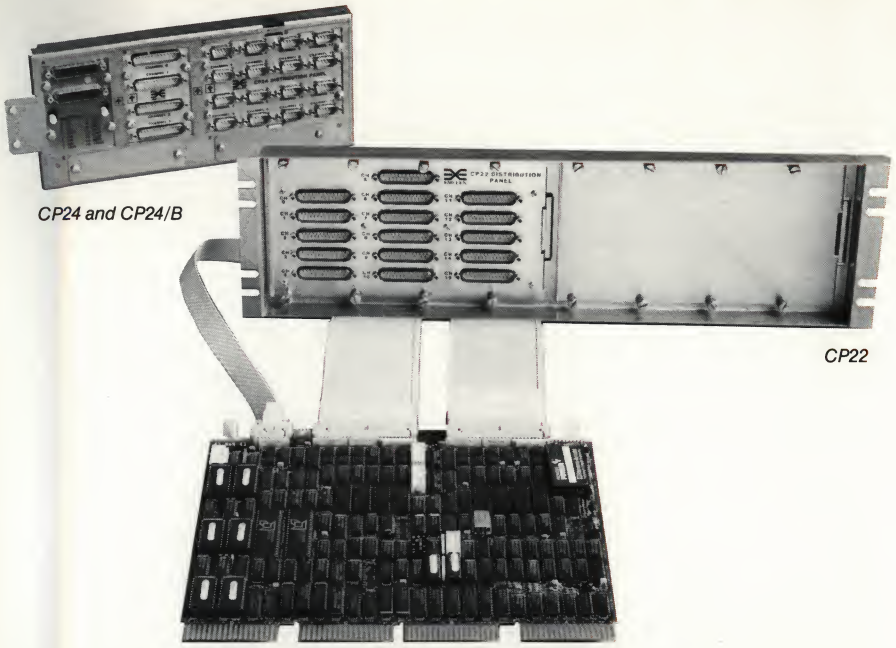
THE GENUINE ALTERNATIVE FOR MICRO/PDP-11 AND LSI-11/2 THROUGH LSI-11/23 PLUS* COMMUNICATIONS MULTIPLEXERS

EMULEX CS02/H SERIES DHV11 AND DH11 COMPATIBLE



CP24 and CP24/B

CP22

WHEN IT COMES TO HIGH PERFORMANCE ON THE QBUS FOR DEC'S MICRO/PDP-11 AND DEC'S LSI-11/2 THROUGH LSI-11/23 PLUS, EMULEX CUSTOMERS CALL FOR AN ENCORE...

An encore of excellence in multiplexer design. A reappearance of the increased line capability, the bit-slice microprocessor architecture, and the compact design inherent in all EMULEX communications products. Another offering of Genuine Alternatives to DEC.

EMULEX responds with the **CS02/H SERIES 16-LINE ASYNCHRONOUS MULTIPLEXER SUBSYSTEM.** High performance on the QBus with 8 lines more than DEC's DHV11. Bravo EMULEX!

*DEC, LSI-11, MICRO/PDP-11, and QBus are trademarks of Digital Equipment Corporation.

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FOR THE MICRO/PDP-11...

...EMULEX presents the CC02 communications controller and CP24 distribution panel combination. This multiplexer system yields RS-423 (RS-232-C compatible) capability on sixteen full-duplex lines. An optional CP24/B panel extends four of these lines to full modem control.

FOR THE LSI-11/2 THROUGH THE LSI-11/23 PLUS...

...EMULEX introduces the CC02 communications controller and CP22 distribution panel combination. Here, twelve lines with partial modem control (full duplex applications) and four lines with full modem control (full or half duplex applications) function together in one small distribution panel. All sixteen channels contain RS-423 (RS-232-C compatible) electrical interfaces.

BOTH VERSIONS HANDLE SIXTEEN LINES. BOTH CONFORM TO EXISTING SPACE WITHIN THE DEC SYSTEMS. AND BOTH PROVIDE THE FOLLOWING SPECIAL FEATURES:

TWO EMULATIONS. Through switch selection, a single CC02 controller provides functional emulation of either one DH11 *or* two DHV11's.

HIGH PERFORMANCE. All sixteen lines of the CS02/H can transmit at 38.4 Kbaud for a total throughput of 60K characters per second (8-bit characters with 1 start, 1 stop, and 1 parity bit).

LINE FORMAT FLEXIBILITY. The following line parameters are available for program selection: speed (to 38.4 Kbaud per line); character size (5–8 bits); stop bits (1, 1.5, 2 bits); parity (odd, even, none).

SOFTWARE SUPPORT. An emulation of either the DEC DHV11 or the DEC DH11, the CS02/H allows transparent execution of standard DEC operating software.

INTERNAL SELF-TEST. Power-up self-tests of the controller circuitry reinforce system reliability each time the multiplexer comes on line.

LINE SPEED FLEXIBILITY. All commonly used line speeds are available, plus split speeds for different rates in transmit and receive operations.

22-BIT ADDRESS. The CC02 controller is implemented with full 22-bit hardware addressing to handle the 4 MByte memory capacity of the LSI-11/23 PLUS.

EXTRA FIFO CAPACITY. As a DH11 emulation, the CS02/H provides one 256-character FIFO buffer per sixteen lines. That's four times the FIFO capacity of the corresponding DEC product. As a DHV11 emulation, the CS02/H provides one 256-character FIFO buffer for each group of eight lines in the sixteen-line system.

WHEN USED AS A DHV11 EMULATION, THE CS02/H FURTHER ENHANCES ITS PERFORMANCE WITH...

DMA/PIO OUTPUT SELECTION. Software driver selection of either DMA or PIO output operation ensures maximum efficiency with minimum CPU overhead in all applications. All DMA transfers are performed in word rather than byte increments.

AUTOMATIC XON, XOFF OPERATION. This software driver-selectable option allows the controller to use XON/XOFF protocol to manage data flow in either direction on a per line basis without program intervention. CPU overhead and the possibility of lost characters are thereby reduced.

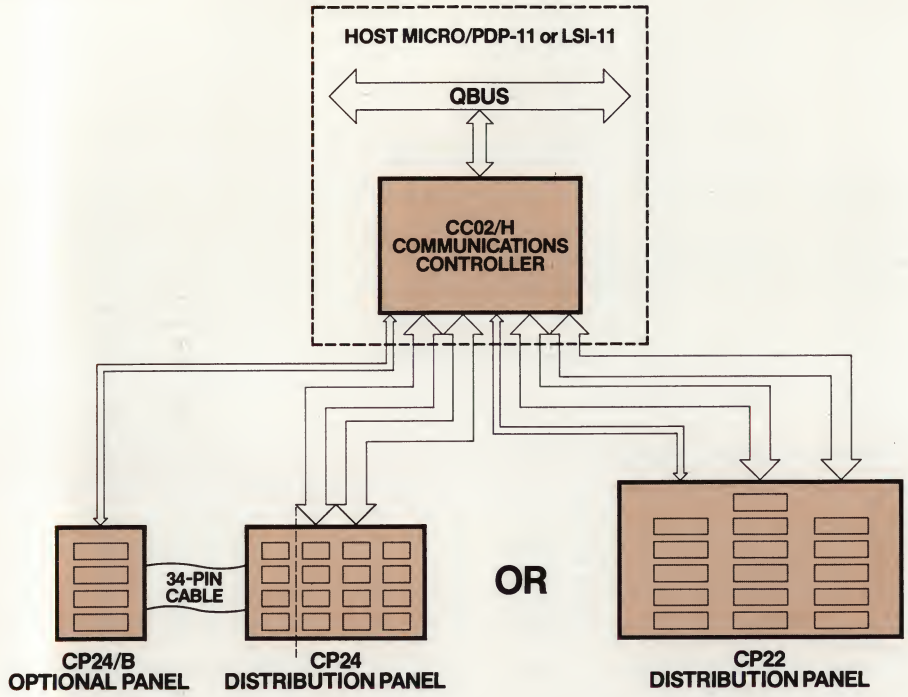
BACKED BY QUALITY COMPONENTS AND EXCELLENT SERVICE, OUR HIGH-PERFORMANCE QBUS PRODUCTS ARE SET FOR A LONG RUN.

All active components are pre-aged for over 160 hours. All final product assemblies are environmentally cycled at full power for over 96 hours. And all EMULEX products are backed by a full one year warranty and supported worldwide by the company's technical applications group.

INCREASED LINE CAPABILITY AND OPTIMUM PACKAGING MAKE THE CS02/H SERIES A SURE HIT...

The central element of both multiplexer configurations in the CS02/H Series is the CC02 Communications Controller. A single quad-size board requiring only one bus load, the CC02 contains all of the active circuitry in the system, including USART line interfaces for all sixteen multiplexer channels.

Several different distribution panels interface with the CC02 in the manner described and illustrated on the following page.



CS02/H SUBSYSTEM ORGANIZATION

When used with the MICRO/PDP-11, the CC02 controller interfaces with either one or two distribution panels: the CP24 and the optional CP24/B. Alone, the CP24 provides sixteen lines with partial modem control. The optional CP24/B panel provides four lines with increased modem control.

Note, however, that when the optional CP24/B panel is connected, the first four lines of the main CP24 panel may not be used. The total number of lines which may be connected to the CP24 panel(s) at one time, then, is always sixteen.

Note also that the sixteen 9-pin connectors on the CP24 panel are not mechanically compatible with the RS-232-C EIA standard, which calls for a 25-pin connector. However, the electrical interface is RS-423 which *is* RS-232-C compatible.

Both the CP24 and the CP24/B distribution panels install into the I/O cutouts of the MICRO/PDP-11 patch panel.

When used with LSI-11/2 through LSI-11/23 PLUS, the CC02 controller interfaces with a single sixteen-line CP22 distribution panel. This panel supports twelve lines with partial modem control (full duplex applications) and four lines with full modem control (full or half duplex applications). All of the lines contain RS-423 (RS-232-C compatible) electrical interfaces. FCC compliant, the CP22 panel installs in place of standard DEC I/O panels.